DOCUMENT RESUME

ED 169 300 CE 020 485

AUTHOR Lake, Robert
TITLE T & I--Drafting and Design, Wood Plaque. Kit No. 11. Instructor's Manual [and] Student Learning Activity Guide.
INSTITUTION Clemson Univ., S.C. Vocational Education Media Center.; South Carolina State Dept. of Education, Columbia. Office of Vocational Education.
SPONS AGENCY Office of Education (DHEW), Washington, D.C.
PUB DATE 78
GRANT SC-5058-76-I-211-0330
NOTE 34p.; For related documents see CE 020 474-566
AVAILABLE FROM Vocational Education Media Center, 10 Tillman Hall, Clemson University, Clemson, South Carolina 29631 (complete set of modules, 14 filmstrips and cassettes, $260.00; set of 87 student modules, $42.50)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Behavioral Objectives; *Designers; *Drafting; Instructional Materials; *Learning Activities; *Learning Modules; Occupational Clusters; *Occupational Information; Prevocational Education; *Sign Painters; *Trade and Industrial Education; Woodworking

ABSTRACT

An instructor's manual and student activity guide on designing and making a wood plaque are provided in this set of prevocational education materials which focuses on the vocational area of trade and industry. (This set of materials is one of ninety-two prevocational education sets arranged around a cluster of seven vocational offerings: agriculture, home economics, distributive education, health occupations, world of work, trade and industry, and office occupations.) The instructor's guide is organized into the following elements: title of activity, duration of activity (ten to fifteen periods), activity goals, instructional objectives (eighteen), related vocational clusters, and activity implementation (description, materials needed, safety considerations, teacher preparation prior to class, during the class, follow-up activities, answer key(s) to instructional objective five and six and a master of a view fact sheet for duplication). The student activity guide provides step-by-step instructions (narrative and illustrations) for completing each instructional objective (e.g., show a thumbnail sketch of a plaque, use router to inscribe on wood, apply varnish to the plaque). At the end of each set of instructions is a student check point (evaluation activity). Occupational descriptions for a letterer, sign painter helper, delineator, hand sign writer, and sign painter conclude the document. (JH)

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T & I – DRAFTING AND DESIGN, WOOD PLAQUE

Kit No. 11

INSTRUCTOR'S MANUAL

Prepared by

Robert Lake
Easley Jr. High School
Easley, South Carolina 29640

State Department of Education
Office of Vocational Education
Prevocational Education
Columbia, South Carolina 29201

In Cooperation With

Vocational Education Media Center
Clemson University
Clemson, South Carolina 29631

1978

CE 020 485

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NATIONAL INSTITUTE OF
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TITLE OF ACTIVITY

Kit No. 11, T & I – Drafting and Design, Wood Plaque

DURATION

Main Activity – 9 to 12 periods
Follow-up Activity – 1 to 3 periods

GOALS

The student will have an understanding of design problems and their solutions. He/she will also manufacture the design.

INSTRUCTIONAL OBJECTIVES

The student will draw a thumbnail sketch of a plaque.

The student will develop 10 rough sketches.

The student will draw one refined sketch.

The student will develop a working drawing.

The student will identify tools used in the design activity.

The student will identify the parts of the router.

The student will measure 16" (40.64 cm) of rough stock.

The student will cut off 16" (40.64 cm) piece of pine shelving.

The student will draw his/her design on the rough stock.

The student will print a name, slogan, or street address on the plaque.

The student will use the router to inscribe (rout) name or slogan on wood.

The student will cut out the design from the rough stock.

The student will file the rough edges of the plaque.

The student will spray the routed words with black paint.

The student will sand off the excess paint on the surface of the plaque.

The student will stain the plaque with a water base stain.

The student will apply varnish or shellac to the plaque.

The student will attach the plaque hanger to the plaque.

VOCATIONAL CLUSTERS

Distributive Education
Health Education
Office Occupations

ACTIVITY IMPLEMENTATION

A. Activity Description

This activity is concerned with design. Almost everything we use in our technological society has to be designed, drawn, and constructed, or manufactured. The people involved in the process range from professional people, like architects, technicians, drafters, to skilled laborers, like painters and carpenters. Your activity will carry you through the jobs listed above. The activity itself is concerned with designing a plaque. This could be a house, slogan, or name plaque. You as a designer will determine the type and shape of your plaque.

B. Safety

Be sure that students wear goggles when operating or observing the router.

Care should be taken when using cross cut saw and coping saw since the blades are quite sharp.

The cleaning agents for the paint brushes are poisonous and flammable. Store them in a cool dry place.

C. Materials

1. Audio Visual Equipment
   None

2. Technical Equipment
   cross cut saws (3)
   wood clamps (8)
   carpenter's squares (3)
   12" (30.48 cm) rulers (25)
   routers (2)
   shoe rasps (8)
   claw hammers (3)
   extension cords (2)
   safety goggles (2)
   coping saws (8)

3. Expendable Supplies
   1" x 12" (2.54 cm x 30.48 cm) pine shelving (16" (40.64 cm) per student, be sure to add 2'

(60.96 cm) for scrap).
25 sheets of carbon paper
100 sheets 8½" x 11" (21.59 cm x 27.94 cm) white paper
3 packages of coping saw blades
1 roll of masking tape
1 can of black spray paint
1 quart (0.946 l) can of varnish and paint thinner, or shellac and denatured alcohol
3 nylon paint brushes, 2" (5.08 cm)
1 can mahogany water base stain
1 package of carpet tacks
1 lb. (0.45 kg) of rags
25 pop top tabs
25 sheets of 40 grit sand paper
old newspapers
2 router bits, ¼" straight cut

D. Preparation Prior to Class

Obtain expendable materials.

Reproduce Student's Checklist, one per student.

Set-up an area in your room for painting and varnishing. Tape old newspapers on one table, floor, and adjoining walls to protect them from damage.

Check tools in kit.

Adjust the router bit to a depth of ¼" (0.635 cm). Don't allow students to use router unless you have checked the depth each day it is in use.

Make an assignment to the students to bring one pop top tab from a drink can.

E. During Class Session

1. INTRODUCTION – This activity is concerned with design. Almost everything we use in our technological society has to be designed, drawn, and constructed or manufactured. The people involved in this process range from professional people, like architects, technicians, draftsman, to skilled laborers, like painters and carpenters. Your activity will carry you through the jobs listed above. The activity itself is concerned with designing a plaque. This could be a house no., slogan, or name plaque. You as a designer will determine the type and shape of your plaque.
2. Pass out the student Checksheet. Explain to your students that the checklists must be checked by you before they proceed through the activity.
3. Give the students the Student Activity Guide.
4. Pass out about 2 sheets of 8½" x 11" (21.59 cm x 27.94 cm) sheets of white paper to each student.
5. Instruct your students to follow the guide and turn in checklists as they complete each Instructional Objective.
6. The first 2 days will probably be concerned with drawing and tool identification objectives.
7. It should take four days for the students to cut out the stock and rout it.
8. Because of drying time, it will take the students about 3 days to paint and finish the plaques.

F. Follow-up Activities

1. Each student will do at least 2 VIEW fact sheets.
2. Students will locate jobs related to designers, draftsmen, woodworkers, painters, and assemblers in the want ads of your local newspaper.

ANSWER KEY

Objective V

1. wood clamp
2. carpenter's square
3. claw hammer
4. shoe rasp
5. cross cut saw
6. rule
7. router

Objective VI

1. chuck
2. base
3. handle
4. trigger (on–off switch)
5. depth adjustment gauge
6. cutting bit

MASTERS FOR DUPLICATION

VIEW Fact Sheet
Student Check Sheet

VIEW FACT SHEET

NAME _____ CLASS _____ OCCUPATION _____

A. List the advantages (good points) of this occupation (job).

B. List the disadvantages (bad points) of this occupation (job).

C. List three things you should know to do this occupation (job).
1.
2.
3.

D. What type of education should you get to be prepared (do) for this occupation (job)?

E. What courses must you take to go into this occupation (job)?

F. What do you think your future in this occupation (job) will be?

G. What wage can you expect in this occupation (job)?

H. What are the working hours of this occupation (job)?

I. To learn more about this occupation (job), write to:

J. Using a scale of 1 to 5, circle the number that measures your interest in this occupation (job) as a possible career.

I don't like it. 1 2 3 4 5 I like it.

T & I – DRAFTING AND DESIGN, WOOD PLAQUE

Kit No. 11

STUDENT
LEARNING ACTIVITY GUIDE

Prepared by

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T & I DRAFTING AND DESIGN

INTRODUCTION

This activity is concerned with design. Almost everything we use in our technological society has to be designed, drawn, and constructed, or manufactured. The people involved in the process range from professional people, like architects, technicians, and draftsmen, to skilled laborers, like painters and carpenters. Your activity will carry you through the jobs listed above. The activity itself is concerned with designing a plaque. This could be a house no., slogan, or name plaque. You as a designer will determine the type and shape of your plaque.

GOALS

1. The student will have an understanding of design problems and their solutions.
2. The student will manufacture the design.

DIRECTIONS

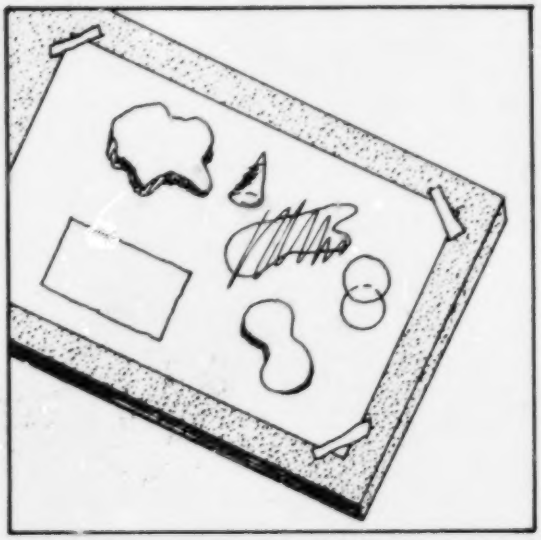
Follow each step carefully. Be sure to have your instructor initial your student checksheet after each objective has been completed.

MATERIAL

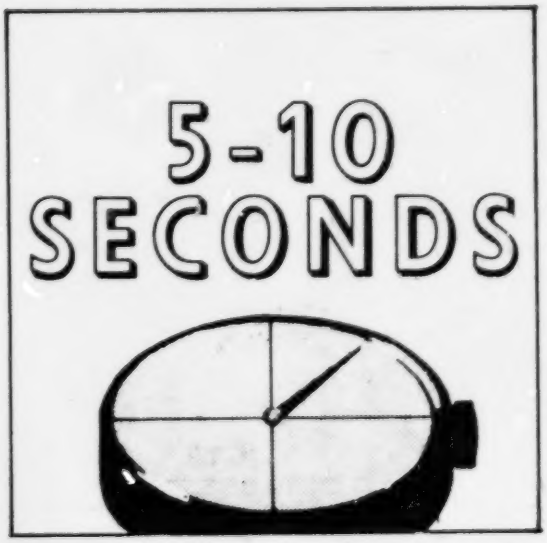
The materials needed for this activity will be acquired during the activity. As you go through the activity you will gain an understanding of their functions.

Instructional Objective 1

The student will draw a thumbnail sketch of a plaque.



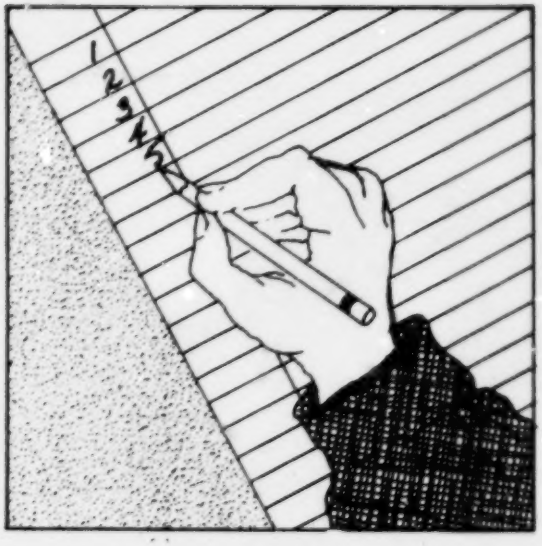
STEP 1 – The term thumbnail sketch refers to something you have done many times – a doodle.



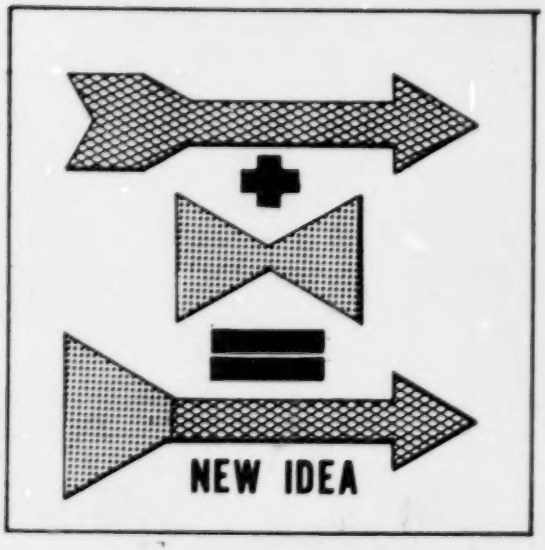
STEP 2 – Each thumbnail sketch should take about 5 - 10 seconds to draw.

Instructional Objective II

The student will develop 10 rough sketches.



STEP 1 – On another sheet of paper number from 1 - 10.



STEP 2 – Combine different parts of your thumbnail sketches to develop a new sketch.

STEP 3 – Draw at least 30 thumbnail sketches. The more you draw, the greater the design possibilities you will have.

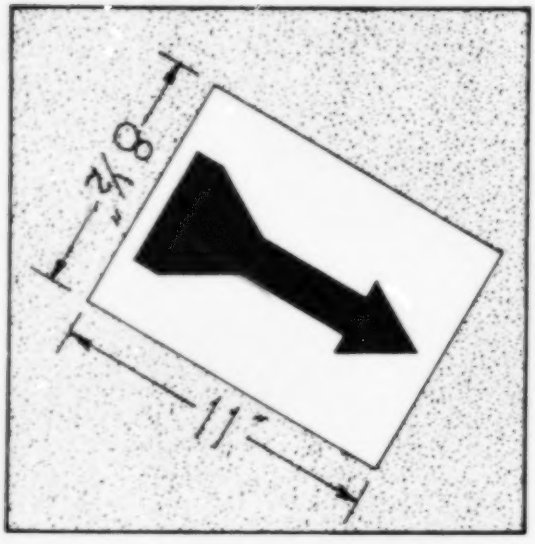
Check Point

Show your thumbnail sketches to your instructor so he/she can check your sheet.

Instructional Objective

The student will draw one refined sketch.

STEP 1 – From your 10 rough sketches, decide which sketch you like the most.



STEP 2 – On a new sheet of paper, draw your idea to the size of your paper.

Check Point

Have your instructor initial your work sheet.

STEP 3 – Do this until you have created at least 10 new ideas. These drawings can be larger than your thumbnail sketches.

Check Point

Have instructor mark your check sheet when completed.

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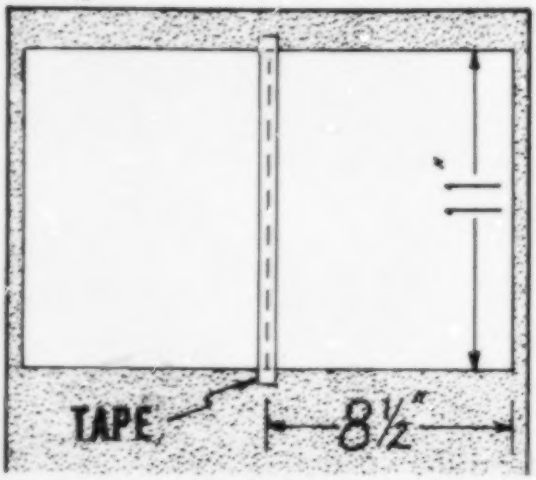
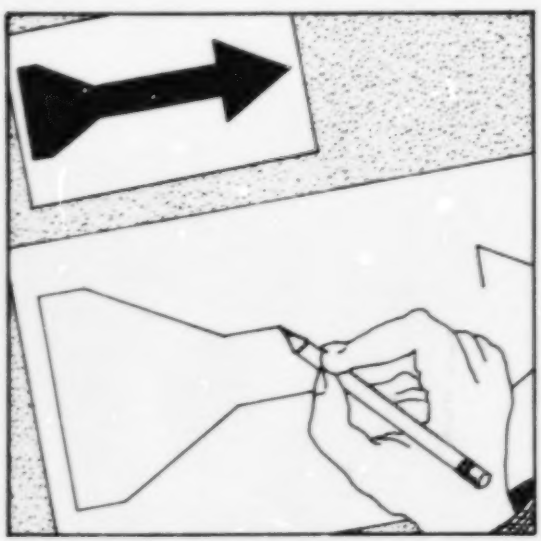
Instructional Objective IV

The student will develop a working drawing.



STEP 1 – Tape two pieces of paper together side by side.



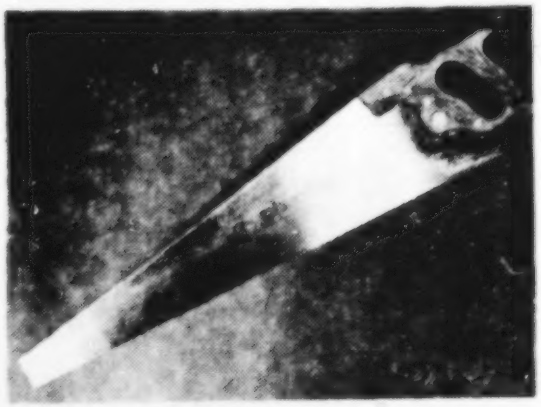
STEP 2 – This is the same size as the piece of wood you will use, so draw your refined sketch as neatly as possible on this large sheet of paper.

Check Point

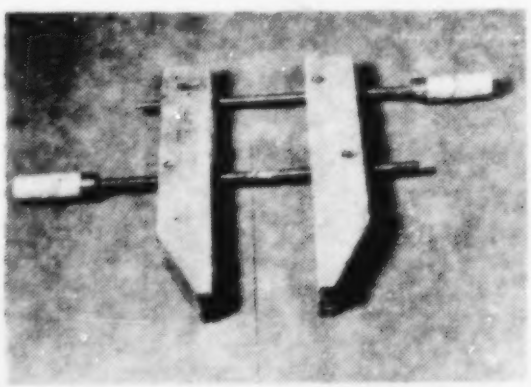
Have your instructor check your work on the work sheet.

Instructional Objective V

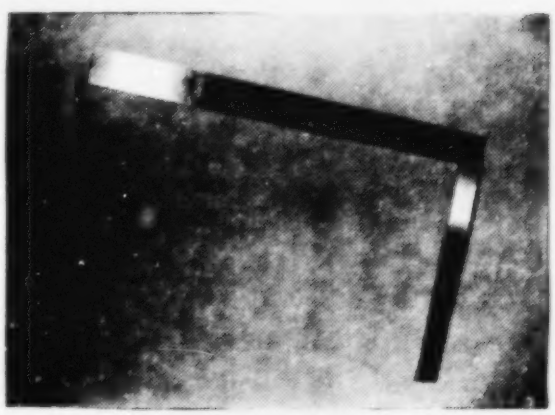
The student will identify seven tools used in the design activity.



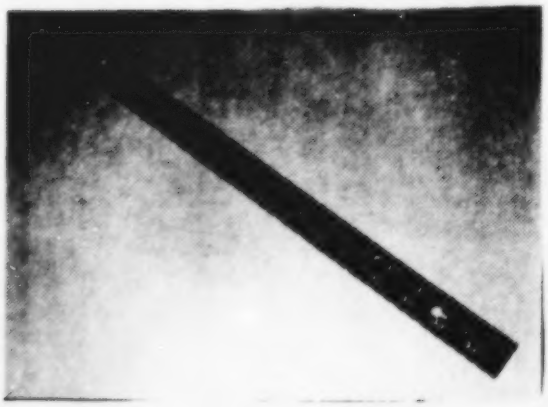
STEP 1 – The tools used in the activity are: the cross cut saw,



STEP 2 – Wood clamp,

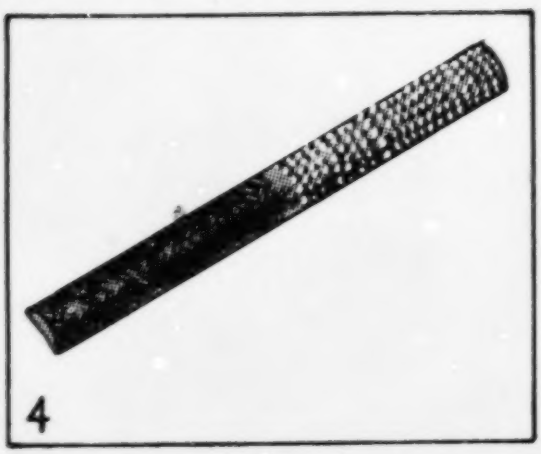


STEP 3 – Carpenter's square,



STEP 4 – 12"(30.48 cm) ruler.

STEP 5 – Router.

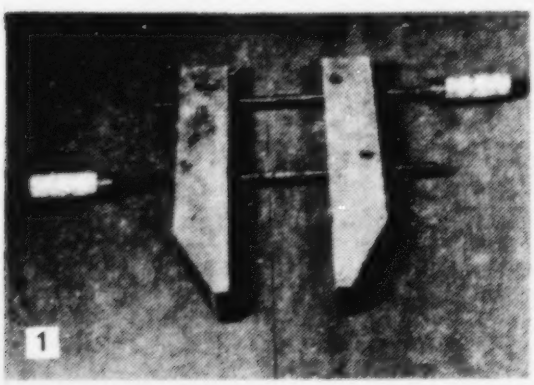


STEP 6 – Shoe rasp.

STEP 7 – Claw hammer.

Check Point

On a separate sheet of paper, list 1 – 7 and identify the following tools. Turn in your sheet to the instructor.



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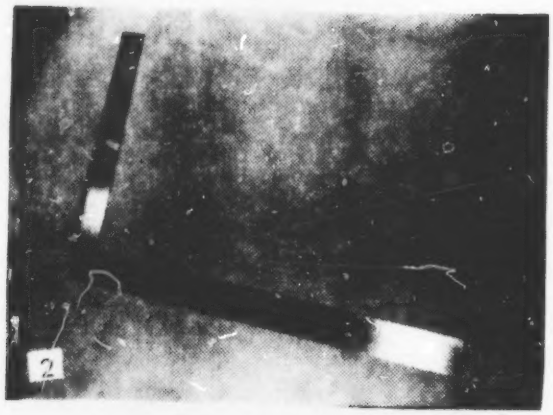
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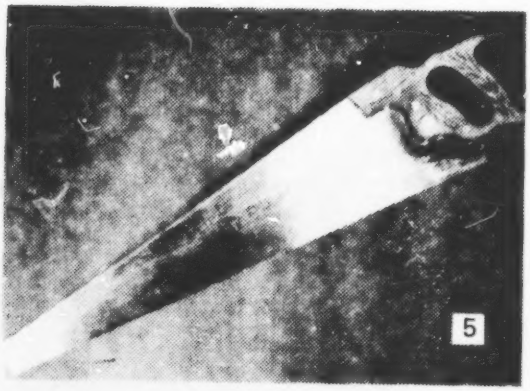
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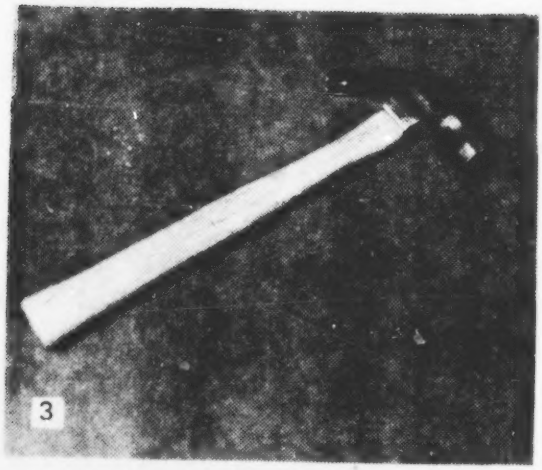
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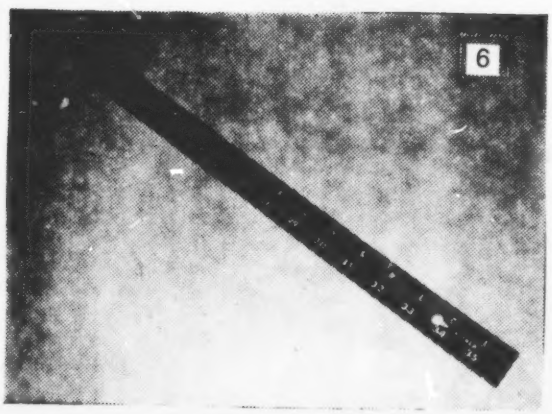
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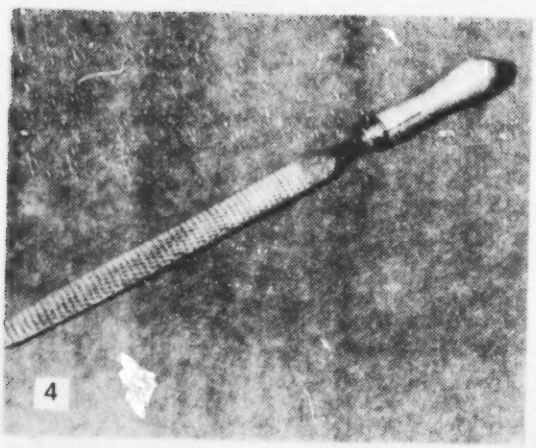
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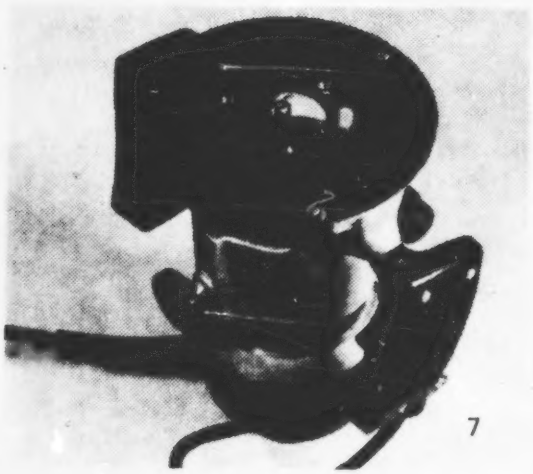
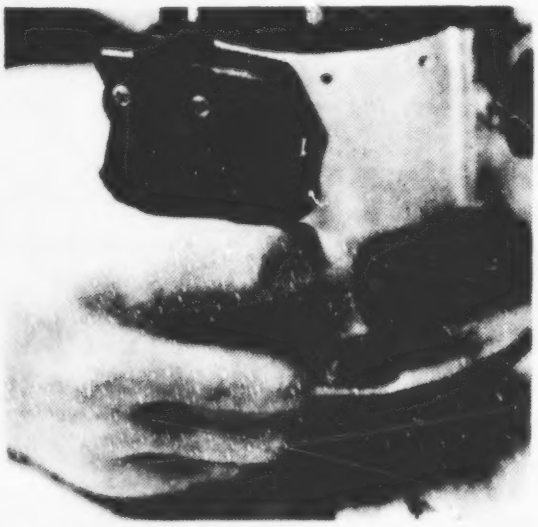

7

Instructional Objective VI

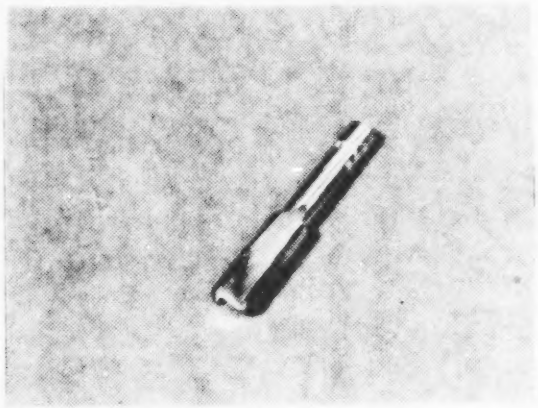
The student will identify the six parts of the router.

STEP 1 – The router has six parts. The most important are the handles. These are the handles.



STEP 2 -- This is the trigger (on-off switch).

STEP 3 – This is the base.



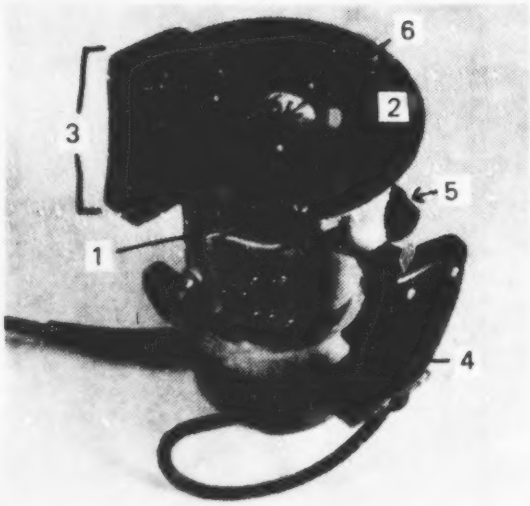
STEP 4 – This is the cutting bit.

STEP 5 – This is the chuck that holds the bit.

STEP 6 – This is the depth adjustment gauge.

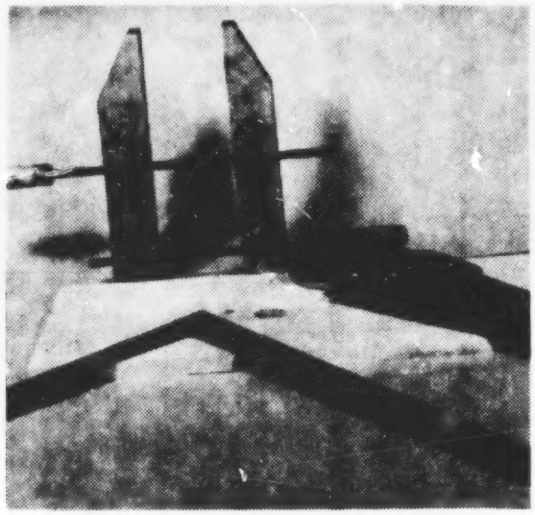
Check Point

On a separate sheet of paper, identify parts 1 – 6 and turn sheet in to your instructor.

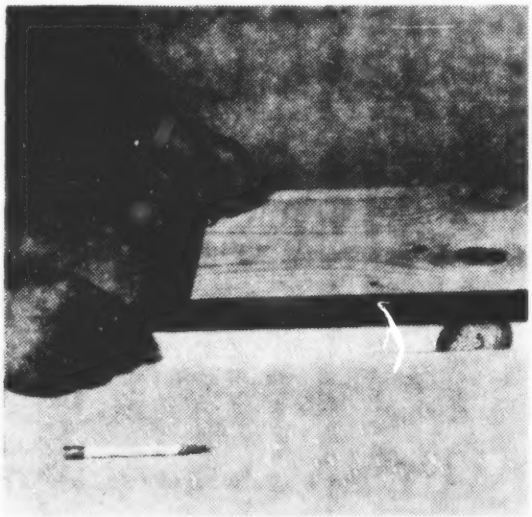


Instructional Objective VII

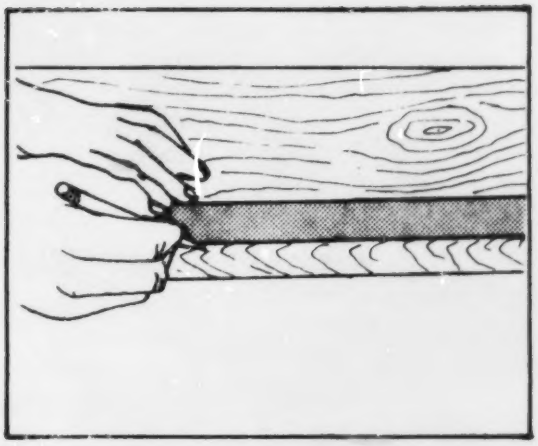
The student will measure 16" (40.64 cm) of rough stock.



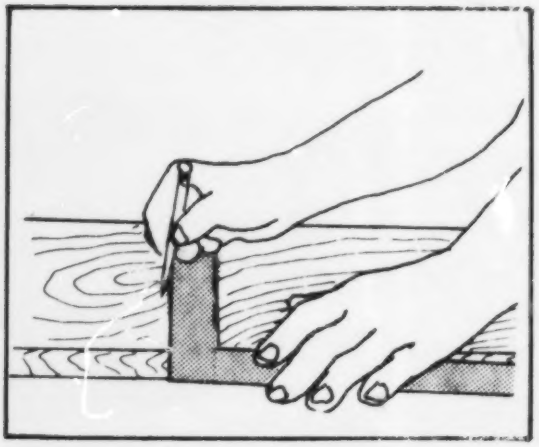
STEP 1 – Obtain a carpenter's square, cross cut saw, wood clamp, and pine shelving.



STEP 2 – Place the corner of the carpenter's square on the end of the pine shelving.



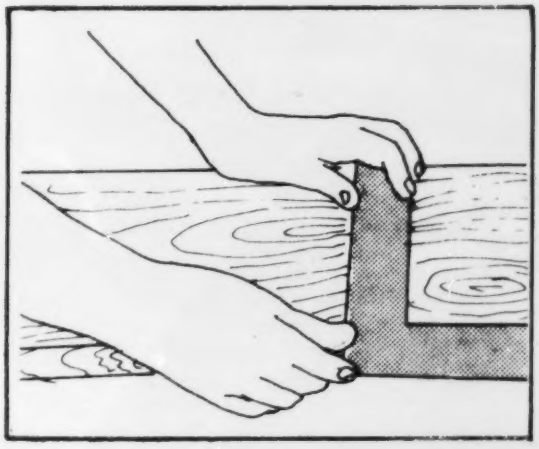
STEP 3 – Measure and mark 16" (40.64 cm) on the long side of the piece of shelving.



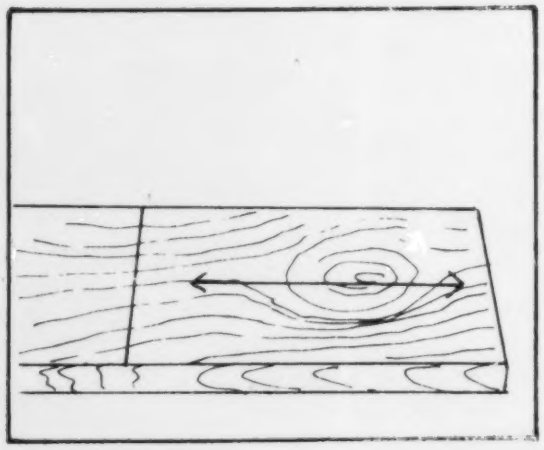
STEP 5 – Slide the square down to your 16" (40.64 cm) mark. Along the straight side of your carpenter's square, mark across your board.

Check Point

Have the instructor or another student re-measure your board.



STEP 4 – Slide the square so you can hook the edge of the board with the inside of your carpenter's square.



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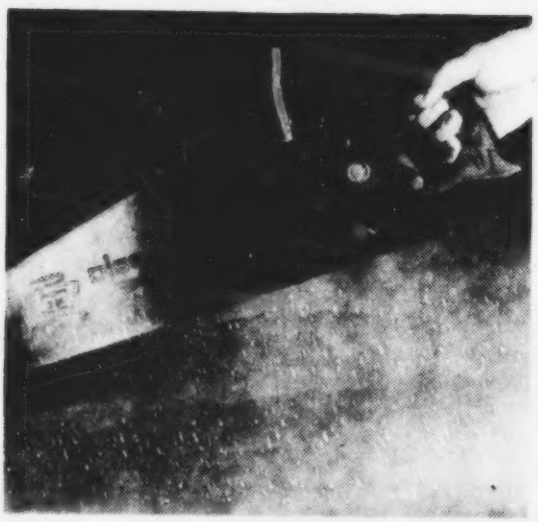
Instructional Objective VIII

The student will cut off 16" piece (40.64 cm) of pine shelving.

STEP 1 – Clamp your pine shelving to a table so that your line extends over the edge of the table.

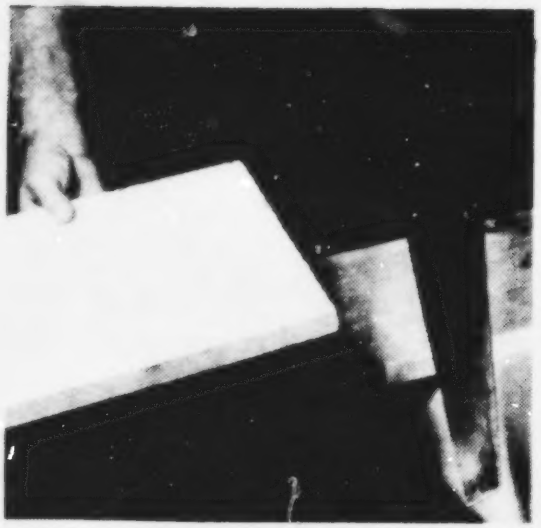


STEP 2 – Hold your saw in your right hand.

STEP 3 – Place your left hand on the board on the left of the 16" (40.64 cm) mark. Place your thumb as a guide for your saw.

STEP 4 – Place the end of the saw next to your board on the mark. Use your left thumb as a guide.

STEP 5 – Draw the saw toward you 3 or 4 times to make a groove to start your cut.



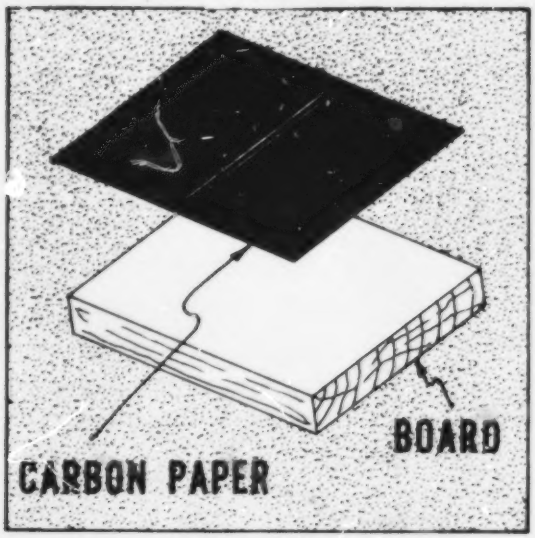
STEP 6 – With a full stroke pull and push saw until your board is cut off.

Check Point

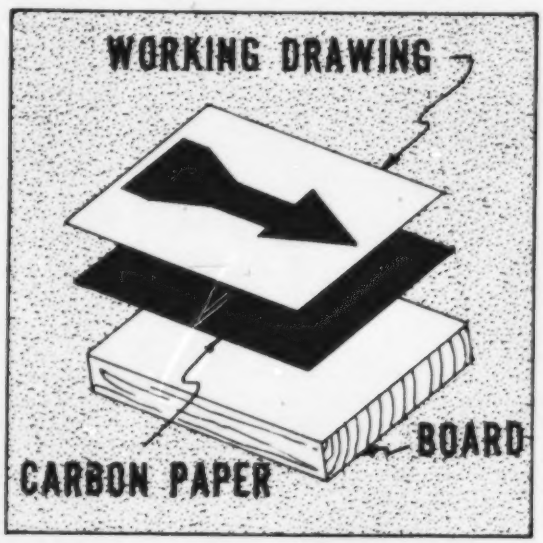
Have your instructor check your work sheet.

Instructional Objective IX

The student will draw his/her design on the rough stock.



STEP 1 – Place 2 sheets of carbon paper face down on your board.

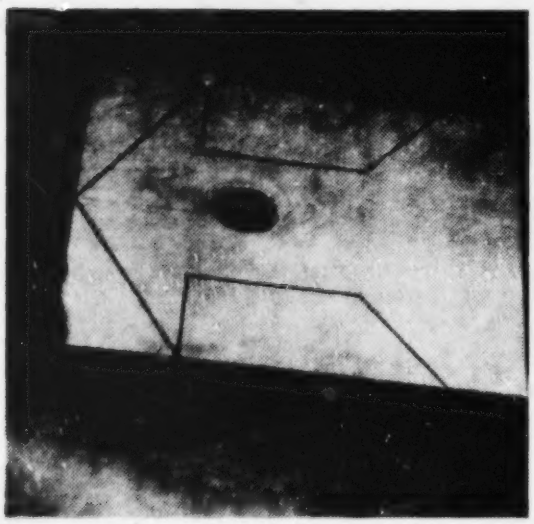


STEP 2 – Place your working drawing on top of the board and carbon paper.

STEP 3 – Trace your drawing by pressing firmly on the working drawing.

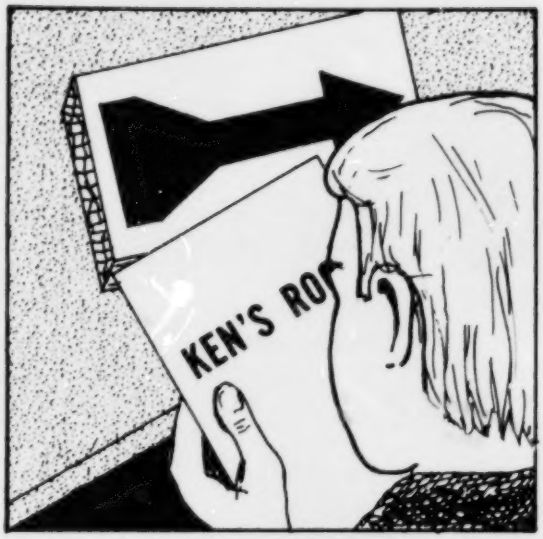
Check Point

Examine your board and be sure the entire drawing is on the board. Have instructor check your sheet.

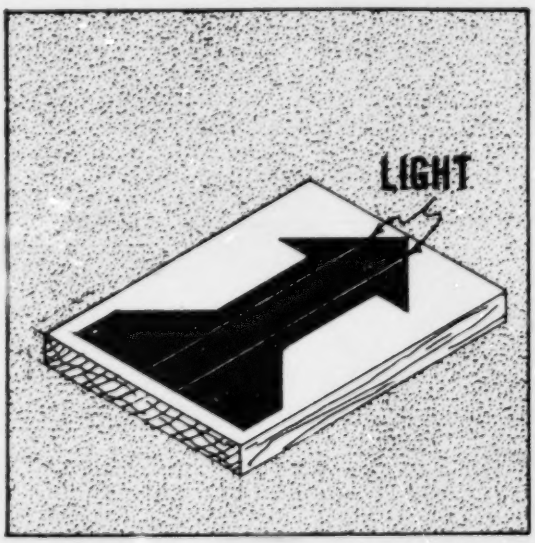


Instructional Objective X

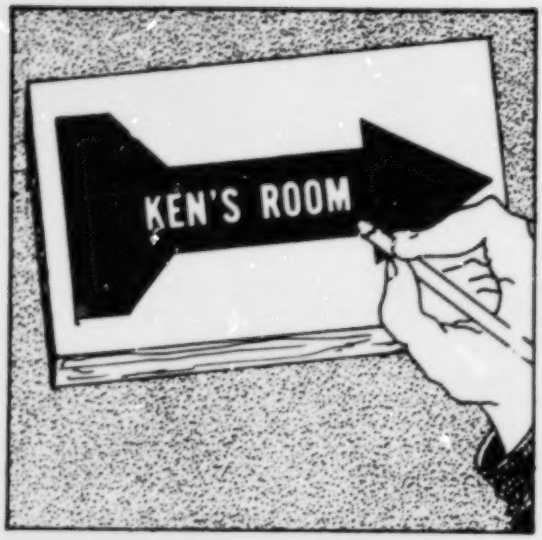
The student will print a name, slogan, or street address on the plaque.



STEP 1 – Look at your plaque's shape and decide in which direction your word should be printed.



STEP 2 – With a straight edge, draw 2 parallel light lines to act as guides in printing.



STEP 3 – Neatly print your idea in the space provided. Be sure not to print near the edge of your board.

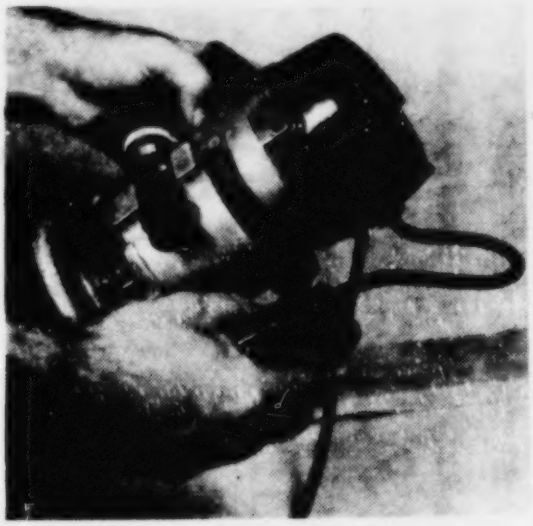
Check Point

Have your instructor inspect your work for neatness and have your checksheet initialed.

Instructional Objective XI

The student will use the router to inscribe (rout) name or slogan on the wood.

STEP 1 – Safety goggles should be worn when using the router.



STEP 2 – Keep your fingers and clothing away from the revolving cutters.

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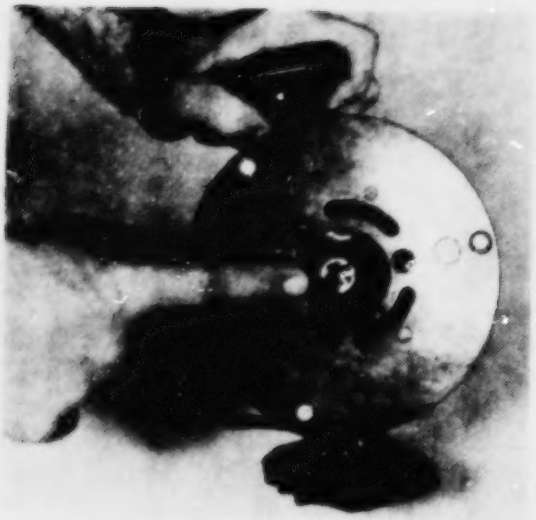
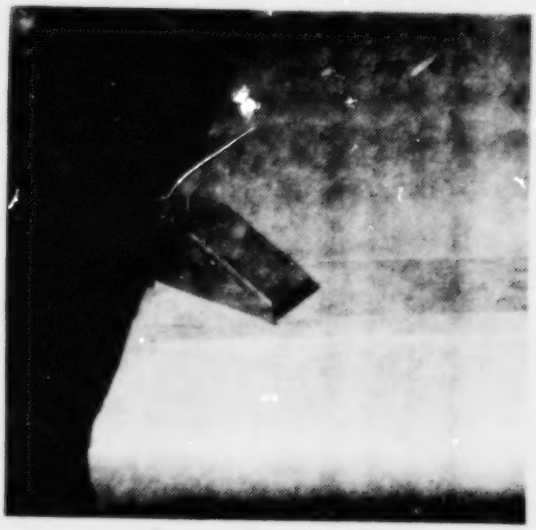


STEP 3 – Be sure the bit is held tightly in the chuck.

STEP 4 – To operate router and to gain a feel for the machine, a scrap piece of wood is needed for practice.



STEP 5 – Using the wood clamp, tighten the wood on the surface of the table.

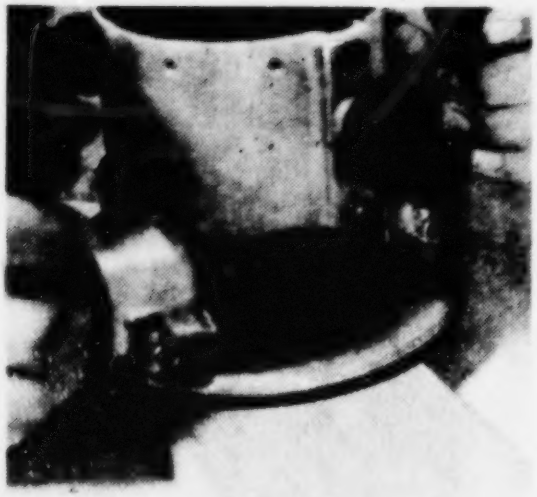
STEP 6 – Draw a few practice letters on the scrap wood.

STEP 7 – Grab the router by its handles.

STEP 8 – Place cutting bit on your practice letter.

STEP 10 – Let the router dig into your wood until the base is resting flat on your work surface.

STEP 9 – Hold the router firmly and press the trigger to start the router.



STEP 11 – Slowly push or pull the router along the lines that form the letter. Do not try to force the machine through the wood.

STEP 12 – When you have finished the letter, stop the machine by releasing the trigger.

STEP 14 – Examine your letter to see how accurately you followed the guide lines. Keep practicing until you feel confident with this machine.

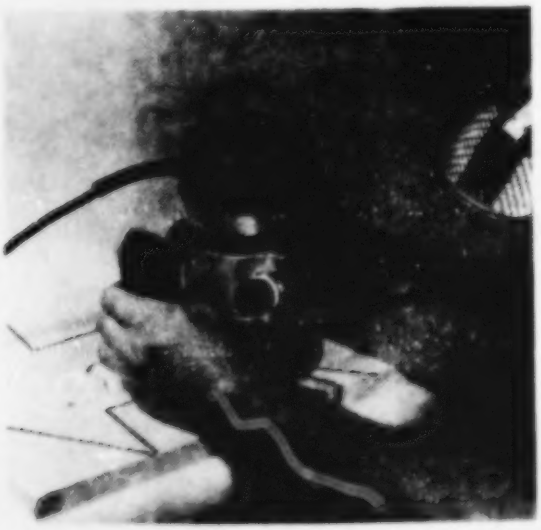
STEP 13 – Return router to its resting position upside down. This prevents the cutting edge from getting dull.

STEP 15 – After you have gained some confidence with the router, you will be ready to try this on your rough stock.

STEP 16 – Follow steps 5 – 16 and rout your entire board. Be sure to avoid guiding the router into the wood clamp. You may have to move or adjust the position of the clamp to avoid this problem.

Check Point

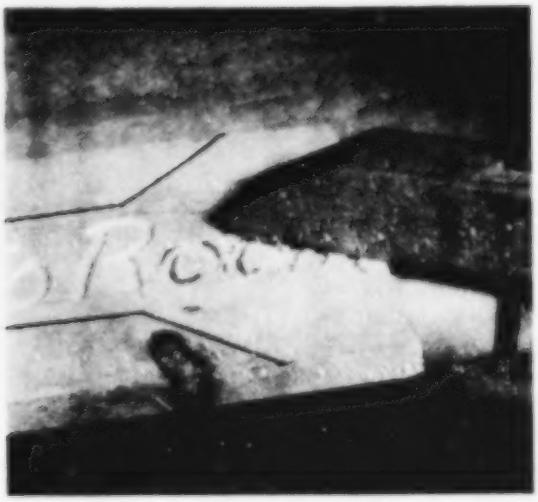
Does your routed plaque look even like this one? If so, have your instructor check your sheet.



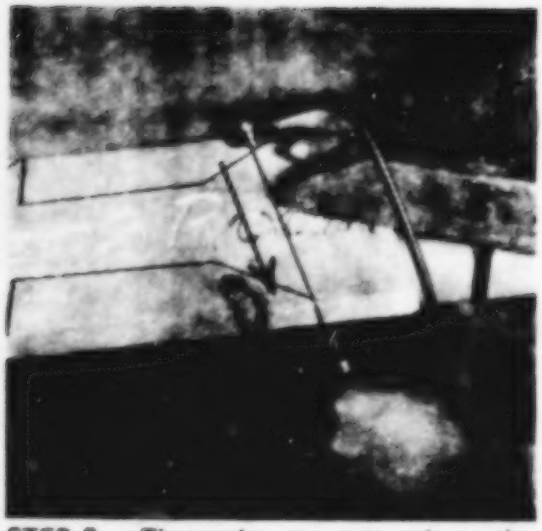
Instructional Objective XII

The student will cut out the design from the rough stock.

STEP 1 – Obtain a coping saw, wood clamp, and your rough stock.

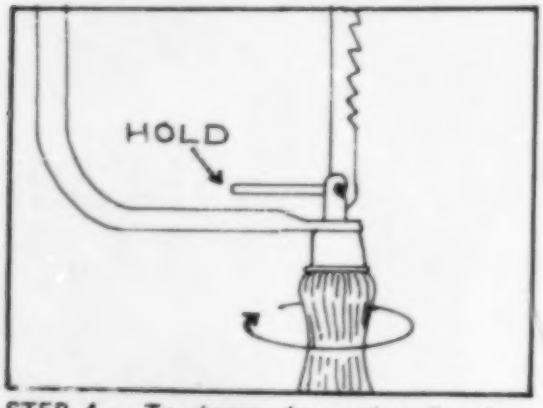


STEP 2 – Clamp your rough stock to the table top so that ⅓ of it lays over the edge of the table.

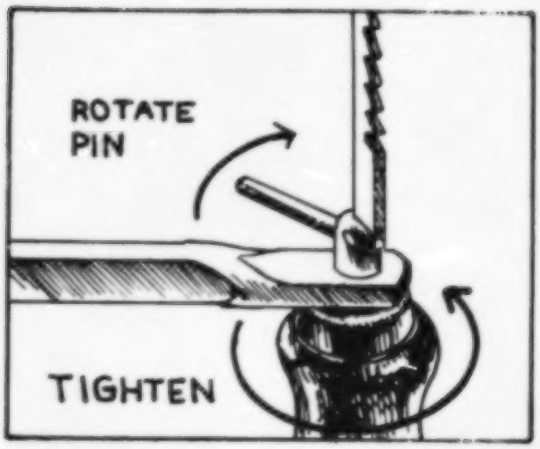


STEP 3 – The coping saw cuts only on the down motion, so with smooth and even strokes (up and down), cut half of your plaque out. Be careful not to cut the table.

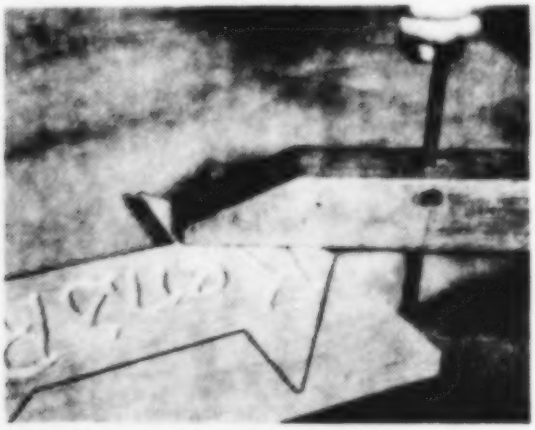
STEP 6 – Release the clamped work piece and turn it around.



STEP 4 – To change the cutting direction, first loosen the handle of the coping saw. Hold the bottom pin; do not let it turn.



STEP 5 – Rotate the clamp pins to position the blade in the direction of the cutting lines and tighten the handle.



STEP 7 – Reclamp your work piece with half of it hanging over the table.

STEP 8 – Cut out the remainder of your design.

STEP 9 – Unclamp your work piece.

Check Point

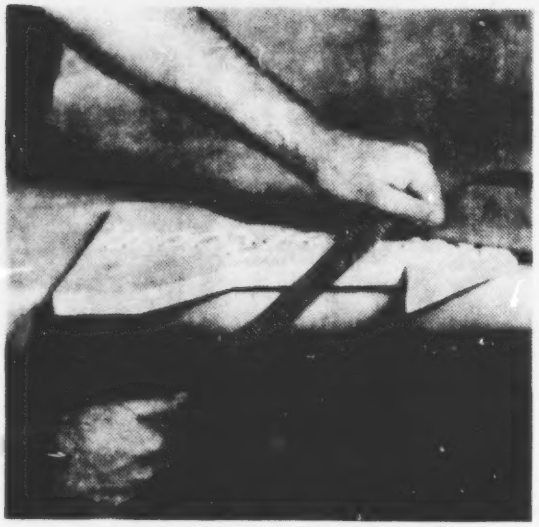
Have your instructor check work sheet.

Instructional Objective XIII

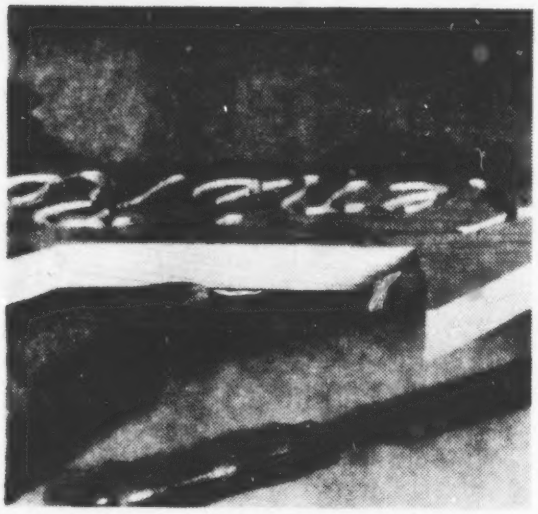
The student will file the rough edges of the plaque.

STEP 1 – Clamp the plaque to the table top. Allow a small portion to hang over the edge of the table.

STEP 2 – Obtain a shoe rasp.



STEP 3 – The rasp cuts and files in one-direction only. You can sit in a chair and push up and away to rasp or file your work piece.



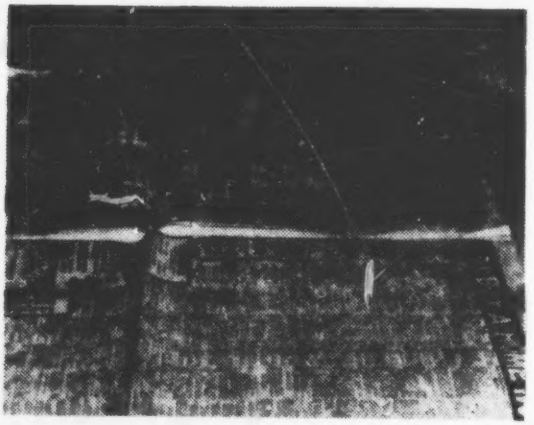
STEP 4 – Rasp and file your plaque until all the cut edges are smooth.

Check Point

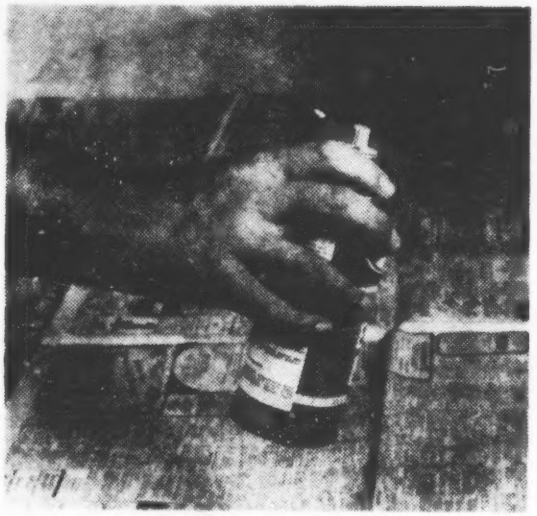
Have your instructor check your work and initial your work sheet.

Instructional Objective XIV

The student will spray the routed words with black paint.



STEP 1 – Go to the paint area. The part of the room with paper taped on the tables, floor, and walls is the paint area.



STEP 2 – Shake the aerosol can until you hear a clicking sound.

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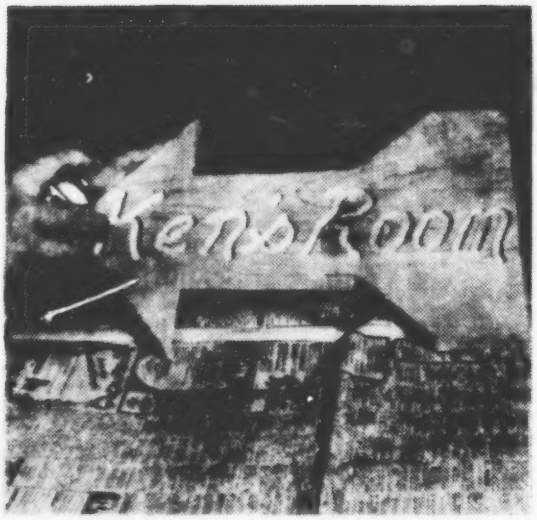
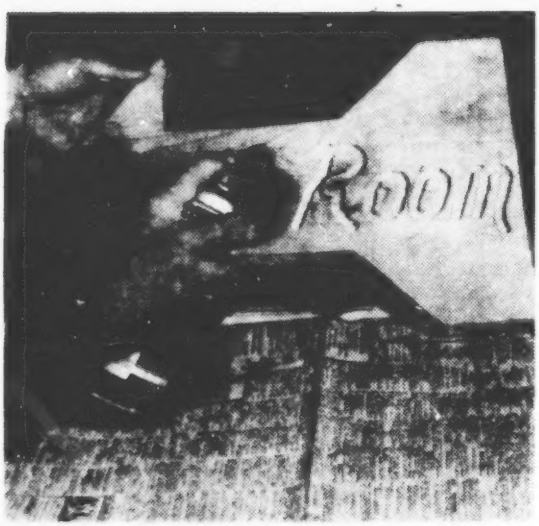


STEP 3 – Place plaque in the center of the paint area.

STEP 4 – Hold can 12" (30.48 cm) from routed words.



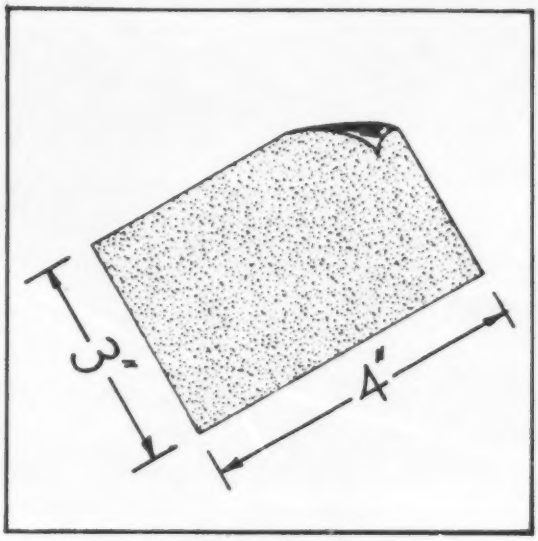
STEP 5 – Press top of can. Spray ONLY the letters on the plaque. Any additional area will cause additional work later. Wait until dry.

Check Point

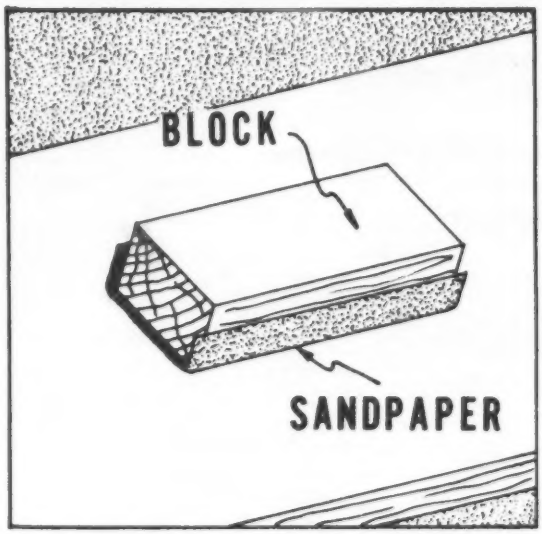
Have instructor inspect work and sign check sheet.

Instructional Objective XV

The student will sand off the excess paint on the surface of the plaque.



STEP 1 – Obtain a 3" x 4" (7.62 x 10.16 cm) sheet of sandpaper.



STEP 2 – Wrap sandpaper around scrap block of wood.

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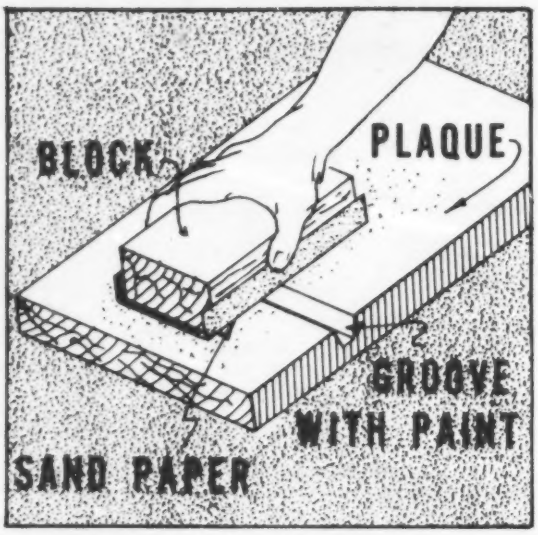


STEP 3 – By pushing and pulling the sandpaper across the surface of the plaque, you will not sand off the black paint in the grooves.

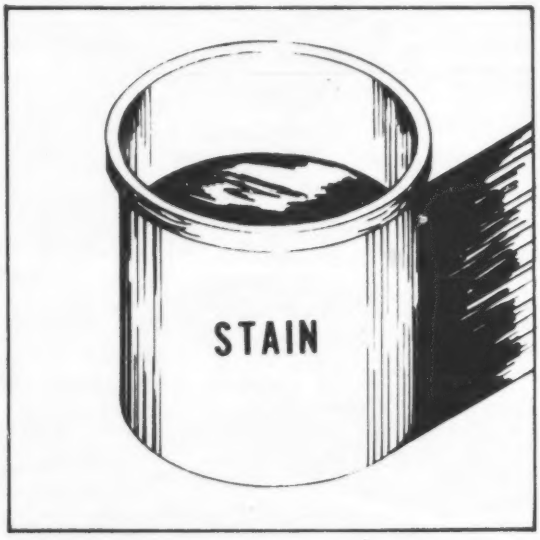
Check Point

Is your work surface clean of any black paint?

Have your instructor sign your check sheet.

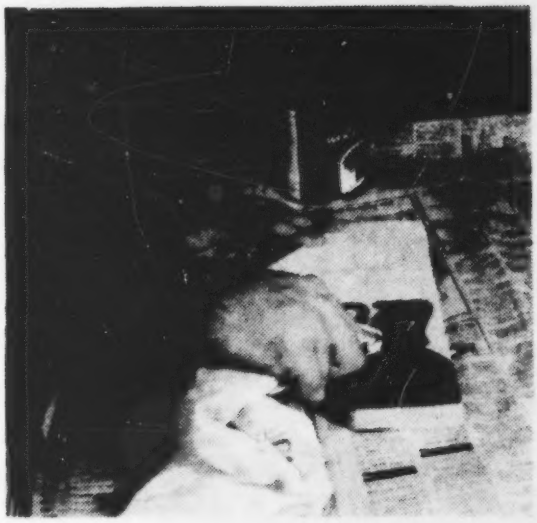
Instructional Objective XVI

The student will stain the plaque with a water base stain.



STEP 1 – Stain is a color added to wood. It is just as permanent as the stain you get on your clothes from grape juice. Do this objective in the area where you sprayed your plaque black.

STEP 2 – Dip part of a cloth into the stain.



STEP 3 – Apply the stain on the wood by rubbing the wood with the stained cloth.

STEP 4 – Allow stain to dry according to the directions on the can.

Check Point

When dry, show your instructor so he can sign your check sheet.

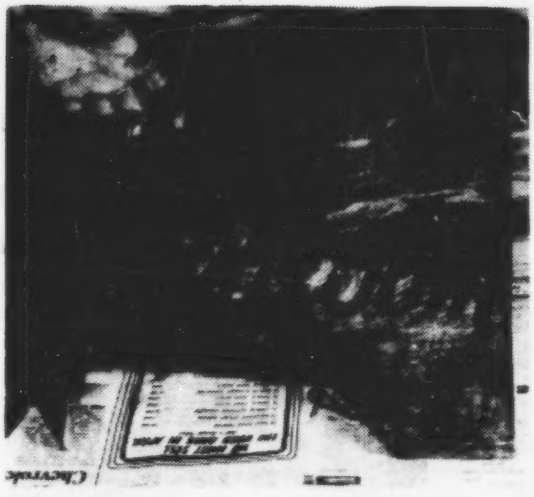
Instructional Objective XVII

The student will apply varnish or shellac to the plaque.

STEP 1 – In the same area that you stained your plaque, you will varnish your plaque. Varnish or shellac is a sealer that will protect your plaque from the weather.

STEP 2 – Pick up brush.

STEP 3 – Dip ½ of the brush into can of varnish or shellac.



STEP 4 – Apply varnish or shellac with even motions across the surface of the plaque. Apply only one coat.

STEP 5 – Clean brush after use. If you used varnish, clean brush in paint thinner. If you used shellac, clean the brush in denatured alcohol.

Check Point

After plaque has dried, have your instructor sign your check sheet.

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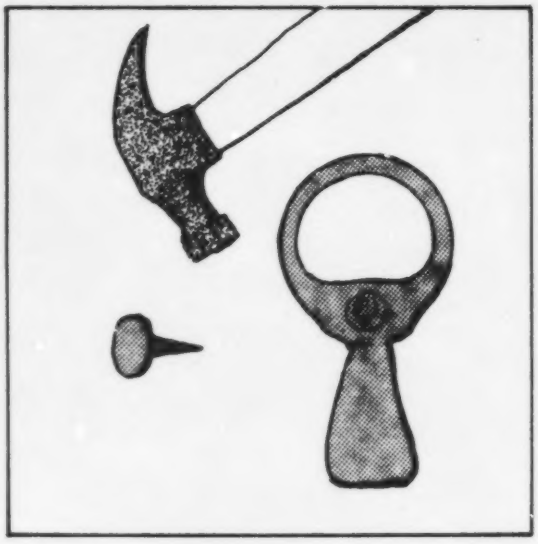
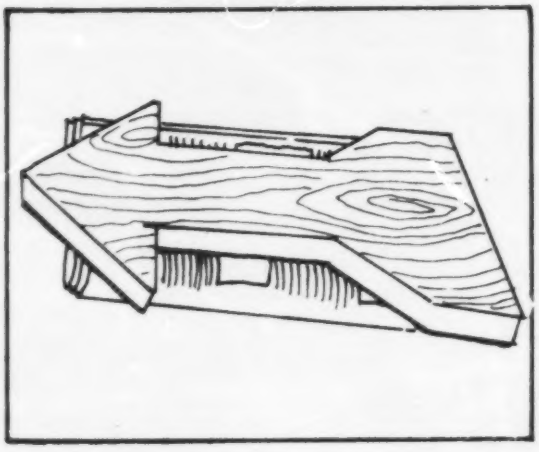
Instructional Objective XVIII

The student will attach the plaque hanger to the plaque.

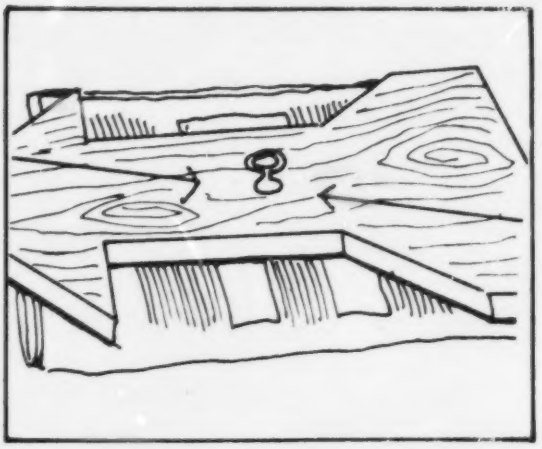


STEP 1 – Obtain a hammer, pop-top tab, and one carpet tack.

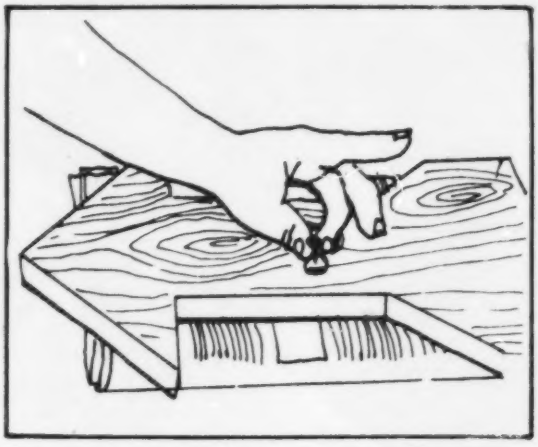


STEP 2 – Turn plaque face down on a newspaper that has been placed on the table.

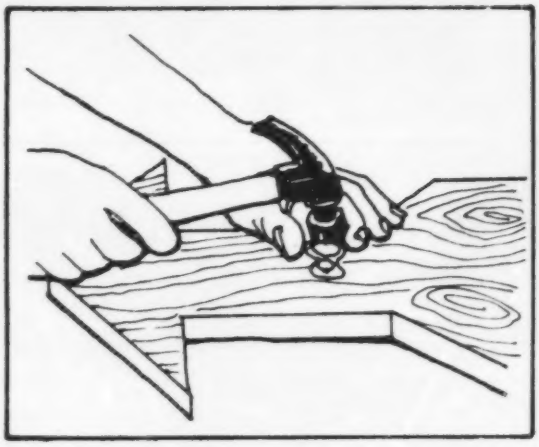
STEP 3 – Try to estimate the center of your plaque.



STEP 4 – Place tab at this point.



STEP 5 – Place carpet tack on flat metal part of the pop-top tab.



STEP 6 – Nail the tab into wood.

Check Point

Have instructor examine your completed plaque and turn in check sheet.

OCCUPATIONAL DESCRIPTIONS

970.661-014 LETTERER (profess. & kin.) commercial artist, lettering.

Paints or draws precise lettering to be reproduced in advertisements, books, and other printed materials, using lettering pen or brush and determining lettering design from layout sketches and instructions. May design lettering when style of letters is not specified.

970.664-010 PAINTER HELPER, SIGN (any ind.)

Assists PAINTER, SIGN (any ind.) to lay out and paint letters and designs to make signs, using handtools: Cleans display boards or other display surfaces to remove foreign matter and rough places, using scraper or scouring brush. Beats dust bag against stencil on display area to create *pounce I* pattern. Traces over pounce pattern to prepare outline for PAINTER, SIGN (any ind.) to follow, using pencil. Applies coat of base paint to display surface and paints background of display, using brushes and hand rollers. May mix paint according to established formulas. Performs other duties as described under HELPER (any ind.).

970.281-014 DELINEATOR (profess. & kin.) renderer.

Renders perspective drawings of buildings and manufactured products for display or advertising purposes working from sketches and blueprints and using pencil, pen, charcoal, watercolors, or airbrush. May be designated according to specialization as ARCHITECTURAL RENDERER (profess. & kin.); INDUSTRIAL RENDERER (profess. & kin.).

970.281-022 SIGN WRITER, HAND (any ind.) card writer, hand; show-card writer.

Writes, paints, or prints signs or showcards used for display or other purposes, using brushes. May cut out letters and signs for display purposes from wallboard or cardboard, by hand or machines, such as electrically powered jigsaw or bandsaw.

970.381-026 PAINTER, SIGN (any ind.) letterer.

Designs, lays out, and paints letters and designs to create signs, using measuring and drawing instruments, brushes, and handtools: Reads work orders to determine type of sign specified, work procedures, and materials required. Sketches design on paper, using drawing instruments, such as angles, rulers, and shading pencils. Lays out design on plastic, silk, or tin to prepare stencil, or on paper to draw *pounce* / pattern, using measuring and drawing instruments. Sketches or follows pattern to draw design or lettering onto objects, such as billboards and trucks, using stencils and measuring and drawing instruments. Brushes paint, lacquer, enamel, or japan over stencil, or paints details, background, and shading to fill in outline or sketch of sign, using paintbrush or airbrush. When painting window signs, draws outline of sign on outside window, using chalk, or dusts pounce pattern to mark outline and paints inside of window following drawing or outline, using brush. When making gold or silver leaf signs, forms sign by either of following methods: (1) Paints sign, positions leaf over fresh paint, and removes excess leaf, after sign has dried, using cotton swab and knife blade; (2) Paints inside of window with watersize (glue), applies leaf, and paints sign in reverse on back of leaf, using paintbrush or airbrush. May cut out letters and apply background coating to construct and prepare signs, using tinning shears. May project layout image on paper and trace outline of design, using projector and electric needle. May specialize in maintenance of signs along railroad right-of-way and be called PAINTER, SIGN, MAINTENANCE (r.r. trans.).